ENERGY TECHNOLOGY ENGINEERING CENTER

OPERATED FOR THE U.S. DEPARTMENT OF ENERGY
ROCKETDYNE DIVISION, ROCKWELL INTERNATIONAL

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SPECIAL PROCEDURE

TITLE: BUILDING T012 FINAL SURVEY PROCEDURE

- APPROVALS -

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REV. LTR.	REVISION	APPROVAL/DATE

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JUL 31 1995

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CONTENTS

1.0 PURPOSE

This document provides the procedures for performing the final radiological survey of Building T012. The overall facility description and the technical approach to the final decontamination and decommissioning phases are contained in References 2.1 and 2.2. The primary isotopes of interest are Co-60 (from a stored sealed radiographic source) and enriched uranium (from the unclad fuel used and stored). Therefore a radiological survey for alpha and beta-gamma activity will be performed (See Limits Section 4.2). The scope of this survey includes all of the recently decontaminated areas from Reference 2.2. The remaining Building T012 rooms (109 & 110) are to be 100% surveyed due to the small surface areas involved. This is to ensure that all areas of Building T012 will meet all NRC, DOE and State of California criteria for release of the facility for unrestricted use. Included in the Appendix C is the sampling method to be applied to the data obtained in this survey procedure which will be used in the final radiological survey report. Analyses of the data will use "CUMPLOT" for the final report.

1.1 Sampling Plan

The final radiological survey of Building T012 requires the repetition of a series of specific steps in each of the sample lot to be surveyed. Each area is treated as a separate sample lot for the purposes of statistical analysis. Distinguishable properties for selecting a sampling lot are: 1) Fuel storage tubes, and 2) all remaining surfaces in Building T012. The sampling lots or areas are listed below (see Figures 1 for location with respect to Building T012):

Sample Lot 1: Rooms 109 (Fuel Storage/Equipment Room) and 110 (Critical Test Cell)

Sample Lot 2: Room 109 Fuel Storage Tubes only

If contamination or high ambient radiation is found in any of these areas, the survey will be expanded into neighboring areas and following an investigation a special decontamination procedure will be written to decontaminate those areas and document the findings, and the area will be re-surveyed to the limits prescribed in this procedure.

1.1.1 Walls and Floors

Starting at one corner of an area (NW corner, if possible), a uniform 1-m x 1-m grid shall be superimposed on the floors and walls within the sample lot selected. Each 1-m x 1-m area shall be selected for survey due to the small size of the sample lots for Building T012. For grid surfaces having areas less than 1-m x 1-m, other partial areas adjacent to the square shall be added to obtain 1 m^2.

1.1.2 Structural Surfaces

Structural surfaces will consist of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. 20% of the structural surfaces shall be surveyed. The selection of surfaces to survey should be biased toward those expected to have the highest contamination levels (e.g. ledges, tops of conduit, etc.).

1.1.3 Concrete Pads

Concrete pads shall be surveyed in the same manner as Section 1.1.1, Walls and Floors.

1.1.4 Fuel Storage Tubes

Fuel storage tubes were internally surveyed individually,100%, for alpha and beta-gamma maximum contamination activity. (See section 5.3)

1.1.5 Roofs - Not Applicable.

1.2 Instrument Calibrations and Checks (Reference 2.3)

Measurements of the average and maximum alpha surface activities shall be made with alpha scintillation detectors, sensitive only to alpha particles with energies exceeding about 1.5 MeV. The detectors shall be calibrated with a Th-230 alpha source standard.

Measurements of the average and maximum beta surface activities shall be made with a thin-window pancake Geiger-Mueller tube. The detectors shall be calibrated with a Tc-99 beta source standard.

Measurements of removable surface alpha and beta activity shall be made by wiping approximately 100 cm^2 of surface area using standard (NPO, cloth, 1¾-inch diameter) smear disks. The activity on the disks shall be measured using a low background gas-flow proportional counter. The counters shall be calibrated using Th-230 and Tc-99 standard sources.

The ambient exposure rate at 1-meter from surfaces will be measured using a 1-in. NaI scintillation detector. These instruments shall be calibrated quarterly and daily checks shall be made using an Cs-137 source.

All portable survey instruments shall be serviced and calibrated on a quarterly basis. Daily checks and calibrations shall be performed on all instrumentation (when used) to determine acceptable performance. Reference 2.3 provides further methods and procedures for environmental surveys.

2.0 REFERENCES

2.1. SSWA-AN-0004, D&D Plan For Building T012

2.2 T012-SP-0003, Decontamination and Decommissioning Procedure for Building T012

2.3 N0010P000033, Methods and Procedures for Radiological Monitoring

2.4 Rockketdyne Form 732-A, Rev. 1-91

2.5 DOE Order 5400.5, Radiation Protection of the Public and the Environment

2.6 Federal Register, Volume 46, No. 205, pages 52061 through 52063

2.7 ER-AN-0005, Training Plan for Environmental Restoration of Radioactively Contaminated Facilities, original dated September 17, 1991

2.8 N001OP000032, Training Program for Radiation Protection and Health Physics Personnel

2.9 572-Z, Rocketdyne Environmental Control Manual

2.10 Letter from G. G. Gaylord to J. Juetten, "Request for the Authorized Limits for Release of Facilities without Radiological Restrictions", 94ETEC-DRF-0767, June 1,1994

3.0 SPECIAL EQUIPMENT/MATERIALS

3.1 Equipment

3.1.1 Ludlum Model 2220/1-ESG Scaler/Ratemeter

3.1.2 Tennelec Alpha/Beta Counting System

3.1.3 Ludlum Model 44-9 Thin-Window Pancake GM Probe

3.1.4 Ludlum Model 44-2 High-Energy Gamma Probe

3.1.5 Canberra Series 100 MCA System with High-Purity Germanium Detector

NOTE

"Or equivalent" applies to all above model numbers.

3.1.6 Ludlum Model 44-3 Alpha Scintillation Probe modified and calibrated for 3π counting

3.2 Materials

3.2.1 NPO 1 ¾-inch cloth smear discs, or equivalent

3.2.2 Miscellaneous nonhazardous operating supplies

NOTE

Review the list of hazardous (restricted) materials in Reference 2.9, EC 04.00.

3.3 Special Instrumentation Instructions

Record the equipment number, serial number, date, calibration date, and this procedure number on all radiation survey reports (Reference 2.4) and any other survey information documentation.

4.0 GENERAL REQUIREMENTS

4.1 Safety Precautions Special Instructions

4.1.1 No special safety hazards to personnel and/or equipment should be present at the time of this survey, except two personnel shall be present while working in the building.

4.1.2 General Health and Safety Instructions

The following general instructions shall be observed by all personnel:

a. After each workday, the T012 facility shall be secured.

b. All equipment and/or materials removed from the areas called out in this document shall be secured at the end of each workday.

c. Protective Services will provide first aid support when required.

d. The Site Emergency Plan is established and will be implemented as required.

e. Prior to starting work notify the facility PIC or manager of the SCTI Co-Generation facility.

f. Do not turn off or on any power supply without the permission of SCTI Co-Generation facility.

4.2 Limits

4.2.1 Surface Contamination Limits for Alpha and Beta-Gamma Emitters (Ref 2.5,2.10)

Allowable Total Residual Surface Contamination (dpm/100cm^2)[1]

Radionuclides[2]	Average[3,4]	Maximum[4,5]	Removable[4,6]
U-Natural, U235, U-238, and associated decay products	< 5,000 α	< 15,000 α	< 1,000 α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others[7]	< 5,000 $\beta\gamma$	< 15,000 $\beta\gamma$	< 1,000 $\beta\gamma$

[1] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2] Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[3] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

[4] The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[5] The maximum contamination level applies to an area of not more than 100 cm^2.

[6] The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping

techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[7] This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

4.2.2 Ambient Gamma Exposure Rate Limits (Ref 2.5,2.10)

Ambient exposure rate at 1-m $\leq$ 5 μR/hr above background.

NOTE

This is a final survey procedure for a clean facility. Any areas that exceed limits of this section shall be decontaminated per a separate special procedure and an additional survey performed to document those areas as meeting all DOE, NRC and State of California criteria for release of a facility for unrestricted use.

4.3 Prerequisites

4.3.1 A single designated "working copy" of this final survey procedure will be utilized at the work site. Should changes become necessary, the working copy of this SP shall be redlined and approved by at least the PIC, the Operations Manager, and RP&HPS; the program manager must approve and sign any changes affecting cost or schedule. At the completion of the task covered by this SP, the Survey Procedure, with all redline changes incorporated and signed, and the required Appendices, will be filed with RP&HPS in the T012 project file in building T100.

The designated "working copy" of this SP will be identified as such on the cover page and will be located in an area designated for working copies.

NOTE

General training for RP&HPS personnel is conducted per Reference 2.8 and kept in Building T100 and outlined in Appendix A. Site specific training (facility familiarization and this procedure, etc.) must be verified by the PIC.

4.3.2 Verify that all of the technicians working to these survey procedures have received training courses designated in the work plan and in Reference 2.7. When training is completed, personnel shall sign off training records (Appendices A and B). The PIC shall verify training by signing training records and forwarding to the appropriate Training Coordinator.

_____

4.3.3 The PIC shall verify that each employee working in the area has read and signed the control copy of this document to indicate understanding of the job and instructions.

_____

4.3.4 All personnel that will initial redlines for sign-offs shall sign the initial verification sheet in the back of these instructions.

_____

4.3.5 RP&HPS and the PIC shall verify daily that all daily calibrations and checks are made at the beginning of the work day, at mid-day, and at the end of the work day. The average of the backgrounds and efficiency factors determined at the beginning and end of each half-day shall be used with data obtained during that time period. All calibration and check data shall be recorded on a standard instrument qualification data sheet. Acceptance limits for daily checks shall be established for each instrument at $\pm$ 2σ about the initial calibration value.

RP&HPS_____ PIC_____

4.3.6 The PIC shall verify that all work covered by this SP shall be performed by personnel trained as radiation workers. RP&HPS and Health, Safety and Fire Engineering (HS&FE) will provide monitoring and guidance as required for determining the protective clothing and safeguards needed.

PIC_____

4.3.7 The PIC will verify the training prerequisites using Appendices A & B and discuss the tasks with management and the personnel performing the tasks at the start of each new assignment and on a daily basis during the duration of these operations.

PIC_____

4.3.8 The PIC will arrange and coordinate the transfer of any equipment or personnel present in the sample lots which will effect the survey as determined by RP&HPS.

RP&HPS_____ PIC_____

4.4 Sequence of Activities

4.4.1 Sections 5.3 through 5.13 may be performed in any order, however, each section shall be completed before proceeding to the next selected location.

_____

4.4.2 The steps in Section 5.2.1 through 5.2.3 must be performed in sequence.

_____

5.0 DETAILED PROCEDURE

5.1 Verification that procedure is the latest revision and permission to proceed:

PIC_____ Date_____ Time _____

5.2 Sample Lot 1 Survey Procedure

5.2.1 Sample Lot 1 Gridding

Starting at one corner of an area or in a room (NW corner, if possible), a uniform 1-m x 1-m grid shall be superimposed on the floor and walls. Each 1-m x 1-m area within the sample lot shall be uniquely mraked and selected for survey. If a structural surface is being surveyed, select a 2-ft section out of every 10 ft for sampling. For surfaces having areas less than 1-m x 1-m, a minimum area of 1-m x 1-m shall be surveyed by combining the other remnant areas. Complete gridding for the entire Building T012. All ambient gamma measurements will be taken for Building T012 in this Sample Lot.

NOTE

Structural surfaces will consists of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. 20% of the structural surfaces shall be surveyed.

_____

5.2.2 Alpha Average Contamination Measurements

5.2.2.1 With a calibrated portable scintillation instrument set for a 5-min. count time and performance checked to Appendix C, uniformly scan the selected area with the alpha probe. Watch and listen for "hot spots" where radioactivity may exceed the average limit and mark the locations. These are to be resurveyed per Section 5.2.3 as "hot spots".

_____

5.2.2.2 Record the sample lot number, room number (if any), grid location number, alpha total activity averaged over 1 m^2, alpha survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

_____

5.2.3 Alpha Maximum Contamination Measurements

5.2.3.1 Return to any area previously identified as having a "hot spot." Repeat the 5-min. uniform scan of only the "hot spot" area, with the alpha probe.

_____

5.2.3.2 Record the sample lot number, room number (if any), grid location number, alpha maximum activity averaged over 100 cm^2, alpha survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

_____

5.2.4 Beta Average Contamination Measurements

5.2.4.1 With portable scalar instrumentation set for a 5-min. count time and performanced checked to Appendix D, uniformly scan the selected area with the beta probe. Watch and listen for "hot spots" where radioactivity may exceed the average limit and mark the locations. These are to be resurveyed per Section 5.2.5.

_____

5.2.4.2 Record the sample lot number, room number (if any), grid location number, beta total activity averaged over 1 m^2, beta survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.2.5 Beta Maximum Contamination Measurements

5.2.5.1 Return to any area previously identified as having a "hot spot." Repeat the 5-min. uniform scan of only the "hot spot" area, with the beta probe.

5.2.5.2 Record the sample lot number, room number (if any), grid location number, beta maximum activity averaged over 100 cm^2, beta survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.2.6 Alpha and Beta Removable Contamination Measurements

5.2.6.1 Using an NPO or equivalent 1¾-inch diameter cloth swipe, wipe an "S" or "Z" pattern with legs approximately 6-inches long, so as to sample removable contamination from an area of approximately 100 cm^2 within the 1-m^2 area identified and measured with the survey meters.

5.2.6.2 Place the smear in an envelope kit and record the sample lot number, room number (if any), grid location, date and time on the envelope. Save all envelopes for the sample lot together.

5.2.7 Sample Lot 1 Repeated Measurement

5.2.7.1 Repeat steps 5.2.2.1 through 5.2.6.2 for each identified 1-m x 1-m area from step 5.2.1 until all measurements for alpha and beta average, maximum and removable contamination have been recorded for the selected sample lot.

5.2.7.2 When the entire sample lot has been surveyed for removable contamination, count the envelopes at Building T100 or appropriate building with a Tennelec alpha/beta counter for 1 minute counting and provide analyses results to RP&HPS in T100.

_____

5.2.8 Gamma Ambient Exposure Rate Measurements

5.2.8.1 For each selected 1-m x 1-m area of the floor in B/T012, position a calibrated NaI detector, performance checked to Appendix E, at a distance of 1 meter from the center of the survey area using a 1-m tripod or equivalent holder.

_____

5.2.8.2 Obtain a 1-min. integrated count on the selected grid area.

_____

5.2.8.3 Record the sample lot number, room number (if any), grid location number, ambient gamma count, gamma survey instrument background and efficiency factor, instrument number, calibration date, date and time.

_____

5.2.8.4 Repeat steps 5.2.7.1 through 5.2.7.3 until all 1-m x 1-m selected grid areas have been measured and recorded.

_____

5.2.9 Attach one copy of the survey records for Sample Lot 1 to this procedure and provide RP&HPS with the originals for data analysis.

_____

5.3 Sample Lot 2 Survey Procedure

NOTE

The Fuel Storage Tubes were surveyed immediately following the D&D of B/T012. All of the tubes were surveyed. Any tubes found to be above the contamination limits in Section 4.2 were removed and grouted in place. The following describes the steps used. Records and results of this prior activity will be further documented and explained in the final survey report.

5.3.1 Sample Lot 2 Gridding

Starting at one corner of the Fuel Storage Room with the storage tubes locate and uniquely number all tubes. All storage tubes will be surveyed within the sample lot. Complete gridding for the entire sample lot.

5.3.2 Alpha Contamination Measurements

5.3.2.1 With the special 3π alpha probe on a portable scintillation instrument uniformly perform a very slow (0.5 cm/sec) 100% direct frisk of each tube in the wall. Watch and listen for "hot spots" and mark the location where the maximum reading occurs.

5.3.2.2 Record the sample lot number, room number (if any), grid location number of the tube, alpha maximum reading, alpha survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.3.2.3 Return to each tube and count the maximum alpha reading or "hot spot" with the special alpha probe for 1-min.

5.3.2.4 Record the sample lot number, room number, grid location number, alpha maximum activity averaged over 100 cm^2, alpha survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.3.3 Beta Average Contamination Measurements

5.3.3.1 With portable scalar instrument using a pancake G-M probeuniformly perform a very slow (0.5 cm/sec) 100% direct frisk of each tube in the wall. Watch and listen for "hot spots" and mark the location where the maximum reading occurs.

5.3.3.2 Record the sample lot number, room number, grid location number of the tube, beta/gamma maximum reading, survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.3.3.3 Return to each tube and count the maximum beta-gamma reading or "hot spot" with the pancake probe for 1-min.

5.3.3.4 Record the sample lot number, room number, grid location number, beta/gamma maximum activity averaged over 100 cm^2, survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.3.6 Alpha and Beta Removable Contamination Measurements

5.3.6.1 Using an NPO or equivalent 1¾-inch diameter cloth swipe, wipe an "S" or "Z" pattern with legs approximately 6-inches long in each tube, over an area of approximately 100 cm^2 where the maximum reading measured with the survey meters was located.

5.3.6.2 Place the smear in an envelope kit and record the sample lot number, room number (if any), grid location, date and time on the envelope. Save all envelopes for the sample lot together and provide analyses results to RP&HPS in T100.

5.3.7 Repeat steps 5.3.2.1 through 5.3.6.2 for each tube from step 5.3.1 until all measurements for alpha and beta maximum and removable contamination have been recorded for the selected sample lot.

5.4 Attach one copy of the survey records for Sample Lot 2 and any additional documentation for Sample Lots 1 & 2 to this procedure and provide RP&HPS with the originals for data analysis and record keeping.

6.0 COMPLETION REVIEW AND APPROVAL

6.1 Procedure complete:

Facility PIC _____ Date _____

6.2 Procedure reviewed and satisfactory:

Project Engineer _____ Date _____

Quality
Assurance _____ Date _____

Environmental _____ Date _____

6.3 Procedure acceptable and available for external use:

Facility
Manager _____ Date _____

RP&HPS
Manager _____ Date _____

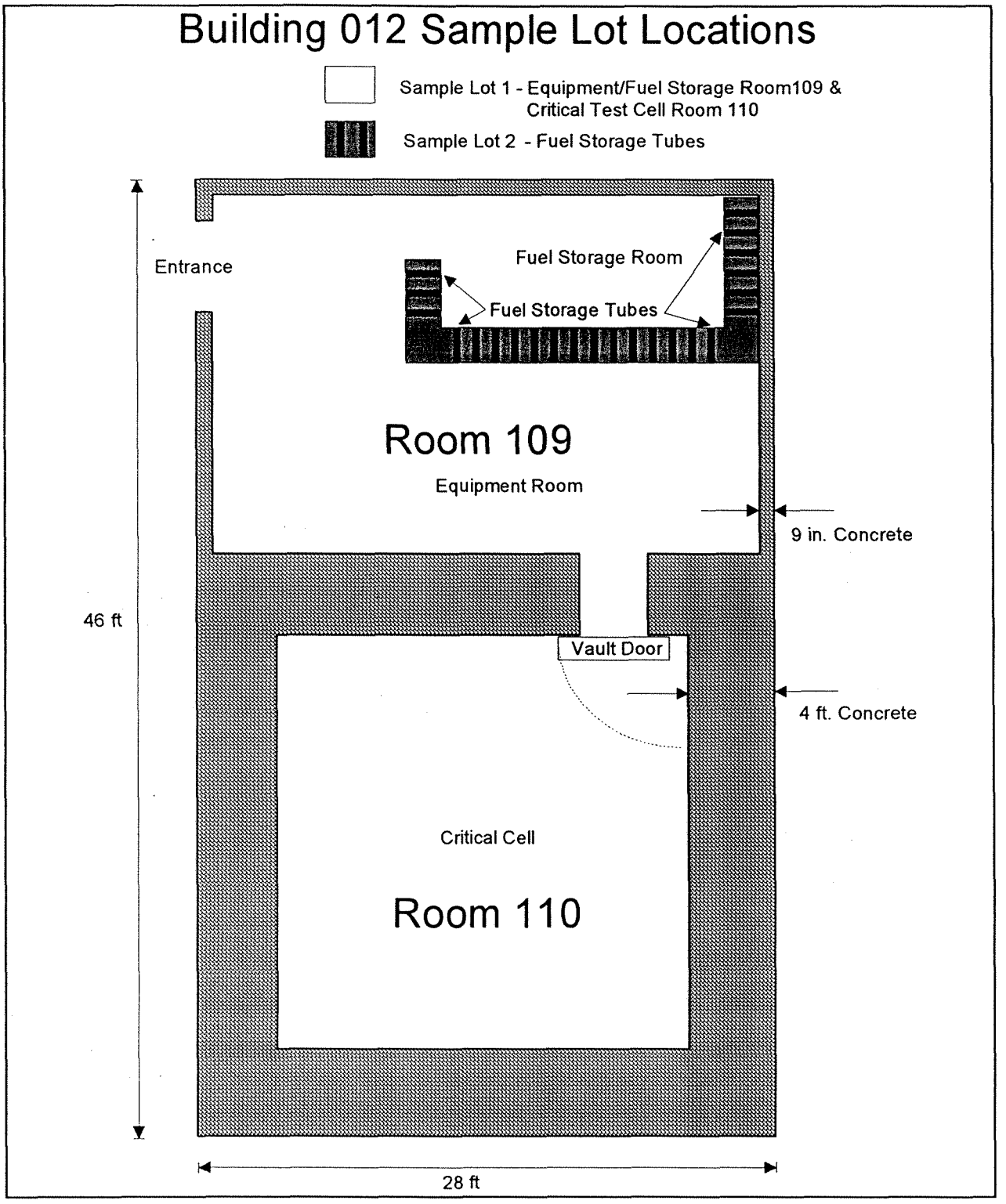


Figure 1 T012 Sample Lot Locations

Appendix A

B/T012 Training Requirements

Course Title	Course No.[1]	Facility Mgr.	PIC	Techs.	RP& HPS	HS& FE	Enviro	Others
Medical Surveillance:								
Radiation	-	-	X	X	X	X[2]	X[2]	X[2]
Respirator	-	-	X	X	X	-	-	-
Training:								
Radiation Suit-up	4020	-	X	X	-	-	-	-
Radworker I Radworker II	4081 4080	X	X	X	X	X[3]	X[3]	X[3]
Radiation Safety-Intro & Discuss	4027	-	-	-	-	X[2]	X[2]	X[2]
Haz. Mat'ls. Com.	4010		X	X	X	X	X	X
Half Mask MSA	1030	-	X	X	-	X	X	-
Full Face	1032	-	X	X	-	X	X	-
Haz Waste Pkg. & Trans.	4028-1	-	X	X	X	-	-	-
Haz. Waste Handling	4004	-	X	X	X	-	-	-
RMMA Discussion	-	-	X	X	X	X	-	-
Fork Lift[4]	2003	-	-	X	-	-	-	X

1) Course number from Technical Skills & Development Department
2) Applies when entry into radiation area is planned
3) Applies when work in radiation area is planned
4) Required for Operators of equipment only

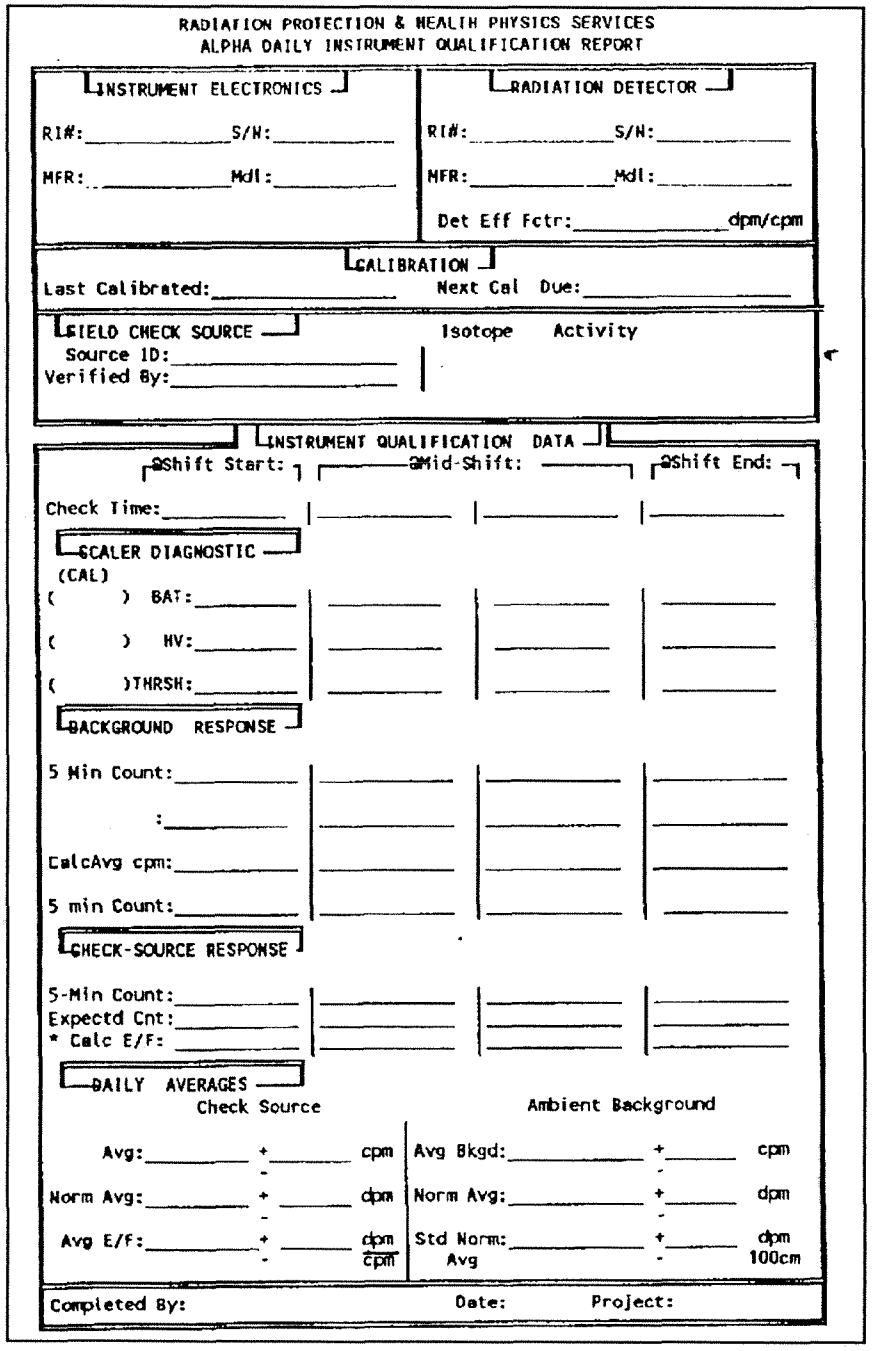
Appendix B

Document Sign-Off Form

NAME (Signature)	SS#	DATE	VERIFIED (PIC)

Appendix C

Alpha Instrument Qualification Data Sheet



RADIATION PROTECTION & HEALTH PHYSICS SERVICES
ALPHA DAILY INSTRUMENT QUALIFICATION REPORT

INSTRUMENT ELECTRONICS

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

RADIATION DETECTOR

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

Det Eff Fctr:_____ dpm/cpm

CALIBRATION

Last Calibrated:_____ Next Cal Due:_____

FIELD CHECK SOURCE

Source ID:_____

Verified By:_____

Isotope Activity

INSTRUMENT QUALIFICATION DATA

	@Shift Start:	@Mid-Shift:		@Shift End:
Check Time:				
SCALER DIAGNOSTIC				
(CAL)				
( ) BAT:				
( ) HV:				
( ) THRSH:				
BACKGROUND RESPONSE				
5 Min Count:				
:				
CalcAvg cpm:				
5 min Count:				
CHECK-SOURCE RESPONSE				
5-Min Count:				
Expectd Cnt:				
* Calc E/F:				

DAILY AVERAGES

Check Source		Ambient Background	
Avg: _____ +/- _____	cpm	Avg Bkgd: _____ +/- _____	cpm
Norm Avg: _____ +/- _____	dpm	Norm Avg: _____ +/- _____	dpm
Avg E/F: _____ +/- _____	dpm / cpm	Std Norm: _____ +/- _____	dpm / 100cm
		Avg	

Completed By: Date: Project:

Appendix D
Beta Instrument Qualification Data Sheet

RADIATION PROTECTION & HEALTH PHYSICS SERVICES
BETA DAILY INSTRUMENT QUALIFICATION REPORT

INSTRUMENT ELECTRONICS

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

RADIATION DETECTOR

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

Det Eff Fctr:_____ dpm/cpm

CALIBRATION

Last Calibrated:_____ Next Cal Due:_____

FIELD CHECK SOURCE

Source ID:_____ Isotope Activity

Verified By:_____

INSTRUMENT QUALIFICATION DATA

	Shift Start:	Mid-Shift:	Mid-Shift:	Shift End:
Check Time:				
SCALER DIAGNOSTIC				
(CAL)				
( ) BAT:				
( ) HV:				
( ) THRSH:				
BACKGROUND RESPONSE				
5-Min Count:				
:				
CalcAvg cpm:				
5 min Count:				
CHECK-SOURCE RESPONSE				
5-Min Count:				
Expectd Cnt:				
* Calc E/F:				

DAILY AVERAGES

Check Source		Ambient Background	
Avg:_____ +/- _____	cpm	Avg Bkgd:_____ +/- _____	cpm
Norm Avg:_____ +/- _____	dpm	Norm Avg:_____ +/- _____	dpm
Avg E/F:_____ +/- _____	dpm/cpm	Std Norm Avg:_____ +/- _____	dpm/100cm

Completed By: Date: Project:

Appendix E
Gamma Instrument Qualification Data Sheet

RADIATION PROTECTION & HEALTH PHYSICS SERVICES
GAMMA DAILY INSTRUMENT QUALIFICATION REPORT

INSTRUMENT ELECTRONICS

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

RADIATION DETECTOR

RI#:_____ S/N:_____

MFR:_____ Mdl:_____

Det Norm Fctr:_____

CALIBRATION

Last Calibrated:_____ Next Cal Due:_____

FIELD CHECK SOURCE

Source ID:_____

Verified By:_____

Isotope Activity

INSTRUMENT QUALIFICATION DATA

	@Shift Start:	@Mid-Shift:		@Shift End:
Check Time:				
SCALER DIAGNOSTIC				
(CAL)				
( ) BAT:				
( ) HV:				
( ) THRSH:				
BACKGROUND RESPONSE				
5-Min Count:				
:				
CalcAvg cpm:				
5 min Count:				
CHECK-SOURCE RESPONSE				
5-Min Count:				
Expectd Cnt:				
* Calc E/F:				

DAILY AVERAGES

Check Source

Avg: _____ + _____ - cpm

Avg E/F: _____ + _____ - dpm

Ambient Background

Avg Bkg:_____ + _____ - cpm

Norm Avg:_____ + _____ - cpm

Avg Bkg: Exp.:_____ + _____ - uR Hr

Completed By: Date: Project: